

## WHAT IS CLAIMED IS:

1. A method for identifying probable strong-interferers in a cellular radiotelephone communications system, comprising the steps of

- (a) providing a measurement and association subsystem,
  - (1) for spatial filtering of all received signals,
  - (2) for measuring received power at each cell tower, from all possible users in each said cell and first adjacent cell tier which will be included in the interference map for each said cell, and
  - (3) for storing said measured data with identification association information;
- (b) at each cell tower, measuring received power from each subscriber to be included in its interference map;
- (c) storing said measured data and association information;
- (d) providing a communications link for sharing said measured data and association information between cells;
- (e) sharing said measured data and association information between neighbor cells;
- (f) calculating an interference table map;
- (g) providing system operating rules to all cells in the system, said rules including decision rules defining strong interferer power levels;

- (h) identifying the strong interferers by application of said decision rules to said interference table map.

2. A method as in claim 1, further comprising

- (f1) providing as part of said system operating rules, rules for partitioning the available communications channels at each cell between all the reuse groups of which each cell is a member; and,
- (f2) apportioning the available communications channels in each cell to said reuse groups according to said rules for partitioning said available communications channels.

3. A method for removing probable strong-interferers in a cellular radiotelephone communications system, comprising the steps of

- (a) providing at least two reuse groups of different reuse numbers;
- (b) identifying the probable strong interferers at each cell;
- (c) providing decision conditions for the reassignment of the probable strong interferers in reuse groups of smaller reuse number to reuse groups of greater reuse numbers; and,
- (d) reassigning each said probable strong interferer in a reuse group of a small reuse number to a reuse group of a greater reuse number, according to said decision conditions.

4. A method for increasing the capacity of a cellular radio-telephone communications system network, comprising the steps of

- (a) partitioning the network into multiple reuse patterns;
- (b) identifying and associating the conversations, according to said conversations' potential interference with said conversations' neighboring cells, in both up links and down links;
- (c) transforming conversations of high risk of creating interference in a reuse group of a given reuse number to a reuse group of greater reuse number;
- (d) maintaining the balance of usage of said multiple reuse groups by said partitioning according to the systems planning; and,
- (e) maximizing the number of communications channels at a small reuse number, thereby maximizing system capacity.

5. A method for increasing the quality of a cellular radio-telephone communications system, comprising the steps of

- (a) partitioning the network into multiple reuse patterns;
- (b) identifying and associating the conversations, according to said conversations' potential interference with said conversations' neighboring cells, in both up links and down links;
- (c) transforming conversations of high risk of creating interference in a reuse group of a given reuse number to a reuse group of greater reuse number;
- (d) maintaining the balance of usage of said multiple reuse groups by said partitioning according to the systems planning; and

- (e) maximizing the number of communications channels at a long reuse number, by assigning not only strong interferers, but as many conversations as possible to a reuse group with large reuse number, thereby minimizing potential of interference in the system.

6. The method of claim 3, further comprising selecting to which communications channel in said reuse group of greater reuse number said probable strong interferer is reassigned in order to minimize risk of interference between subscribers in said reuse group of greater reuse number.

7. The method of claim 4, further comprising selecting to which communications channel in said reuse group of greater reuse number said conversation of high risk of creating interference in a reuse group of a given reuse number is assigned in order to minimize risk of interference between subscribers in said reuse group of greater reuse number.

8. The method of claim 5, further comprising selecting to which communications channel in said reuse group of greater reuse number said conversation of high risk of creating interference in a reuse group of a given reuse number is reassigned in order to minimize risk of interference between subscribers in said reuse group of greater reuse number.

9. A method as in claim 3, further comprising selecting to which communications channels of said reuse groups of small reuse number each

conversation is assigned in order to minimize risk of interference between subscribers in said reuse group of small reuse number.

10. A method as in claim 4, further comprising selecting to which communications channels of said reuse groups of small reuse number each conversation is assigned in order to minimize risk of interference between subscribers in said reuse group of small reuse number.

11. A method as in claim 5, further comprising selecting to which communications channels of said reuse groups of small reuse number each conversation is assigned in order to minimize risk of interference between subscribers in said reuse group of small reuse number.

12. A cellular radiotelephone communications system, comprising

- (a) a plurality of geographical communications region cells, each cell having a plurality of communications channels which may be apportioned between a plurality of reuse groups of different reuse numbers;
- (b) in each said cell, a measurement and association subsystem,
  - (1) for spatial filtering of all received signals
  - (2) for measuring received power at each cell tower, from all possible users in each said cell and first adjacent cell tier which will be included in the interference map for each said cell, and

- (3) for storing said measured data with identification association information;  
including,
    - (1) a multibeam antenna for spatial filtering;
    - (2) a received power measurement device for measuring received power from each subscriber to be included in its interference map;
    - (3) a storage device for said measured data and subscriber association information;
  - (c) in each said cell, a communications link for sharing said measured data and association information between cells;
  - (d) in each said cell, a computing device
    - (1) for calculating and storing an interference table map;
    - (2) for storing system operating rules to all cells in the system, said rules including decision rules defining strong interferer power levels;
    - (3) for identifying the strong interferers by application of said decision rules to said interference table map.
13. A method as in claim 1, further comprising
- (a) continuously measuring received power from said all possible users;
  - (b) continuously calculating said interference map; and,

- (c) continuously identifying the strong interferers.
14. A method as in claim 3, said identifying further comprising
- (a) continuously measuring received power from all possible users;
  - (b) continuously calculating an interference map; and,
  - (c) continuously identifying the probable strong interferers.
15. A method as in claim 4, said identifying and associating further comprising
- (a) continuously measuring received power from all possible said conversations;
  - (b) continuously calculating an interference map; and,
  - (c) continuously identifying said conversations of high risk of creating interference in a reuse group of a given reuse number.
16. A method as in claim 5, said identifying and associating further comprising
- (a) continuously measuring received power from all possible said conversations;
  - (b) continuously calculating an interference map; and,
  - (c) continuously identifying said conversations of high risk of creating interference in a reuse group of a given reuse number.